References

[1] "How accurate is a digital frequency meter?", N. D. N. Bellham, G2BKO. *Radio Communication*, April 1980, p368.
[2] "A proportional temperature-controlled oven", N. D. N. Belham, G2BKO. *Radio Communication*, November 1980, p1151.

Comment

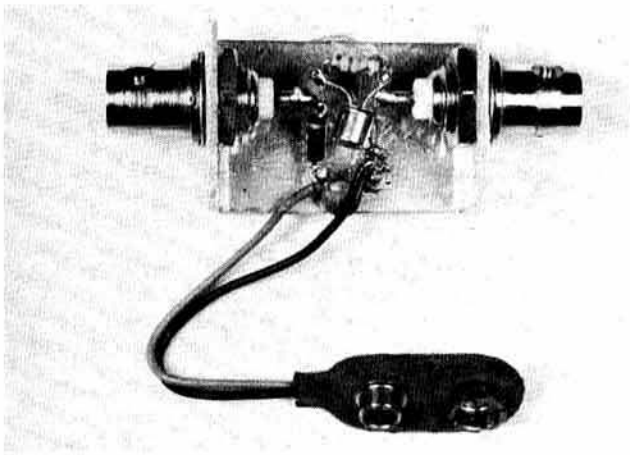
Now back to our programmable dividers with their associated phase locked loops all packed up into convenient black boxes by nifty† Nippons, and yet, convenient as they are, they only cater for a part of amateur radio. A great deal of enjoyment can come from rediscovering for oneself. It does not matter if what you find is already known to the professionals, the enjoyment is yours. There is always the chance that your imagination, able to roam free of current trends and fashions, may light on something so simple that it has been overlooked by professionals. By all means leave the black boxes undisturbed to conserve their value, but do keep a selection of components near the soldering iron! □

†Nifty = spruce, smart, stylish.—*Concise Oxford Dictionary.*

Simple wideband preamplifier

by G. J. JESSOP, G6JP*

MANY preamplifiers have been described from time to time, and generally these have had low noise, high gain, high selectivity or a combination of these features. For many purposes an amplifier having wide-band characteristics with a reasonable noise factor can be a worthwhile addition to a commercial or home-built transceiver or receiver which itself has adequate selectivity.



Interior view of the preamplifier

In most urban locations very low noise preamplifiers are of little practical value, because of the relatively high ambient noise generated by various items of electrical equipment, almost universal use of discharge lamps for street lighting, and the gross noise produced by some cars and motor cycles. A preamplifier that will provide significant voltage gain with reasonable low noise may be built with an absolute minimum of simple components and substantially no adjustments, as detailed below.

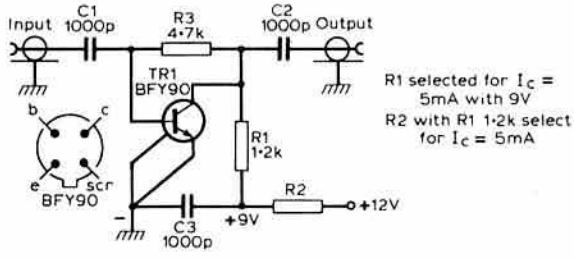


Fig 1. Circuit diagram

Fig 1 shows a circuit which consists simply of two isolating capacitors joined together by a resistor; a transistor connected across the resistor, its base to the input end and the collector to the other end of the resistor; the collector load resistor is connected to this point, and a bypass capacitor connected to the remote end. The most suitable collector current is 5mA for a BFY90 transistor; in its simplest form a 9V battery is all that is required. If the amplifier is to be connected into equipment with a 12V supply, an additional resistor will be needed to set the collector current to the correct value.

An approximate gain/frequency curve for the amplifier is given in Fig 2. This naturally shows some fall-off of gain as the frequency is increased, due to the shunt capacitance effects across the collector load.

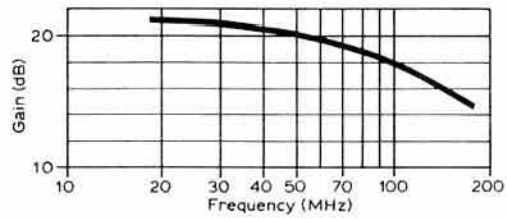


Fig 2. Approximate gain/frequency characteristic

Fig 3 shows the component arrangement. Although BNC connectors were in the original, any alternative may be used. If the amplifier is to be "built-in", the connector can be dispensed with, and one of the isolating capacitors may not be needed, depending on the transceiver's own circuit. The components used were 1,000pF 30V disc ceramic capacitors, 0·25W film-type resistors, and a BFY90 transistor.

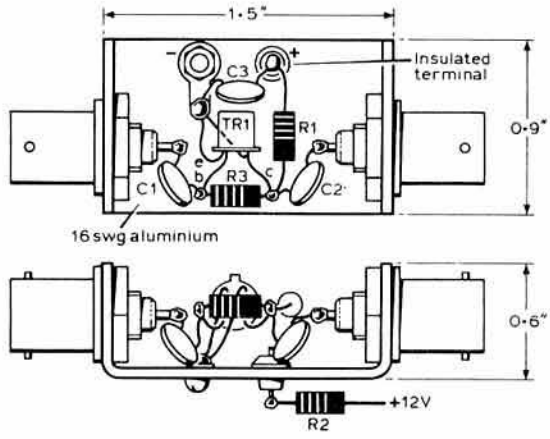


Fig 3. General arrangement of preamplifier

In use on 144MHz, signals that are Q3-4 are improved so that they become a good Q5. Noise is lower than with a standard FT221 alone, but of course car ignition can be heard from a greater distance. The author has several preamplifiers with tuned circuits, but this simple unit gives an adequate signal gain for most purposes. □

*32 North View, Eastcote, Pinner, Middx.